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ABSTRACT

This annotated bibliography on Individually Guided Education (IGE) is intended to help teachers and administrators identify resources needed to improve individualized instruction and learning in elementary and secondary schools. Almost 100 books, technical reports, theoretical papers, practical papers, and working papers are listed in eight sections: (1) books related to the system of IGE, cognitive learning and development, and peer teaching; (2) studies of instructional programming for the individual student (the largest part of the bibliography); (3) studies of administration and organization for instruction; (4) language (reading and communication); (5) studies in mathematics; (6) studies in the implementation of individualized schooling; (7) evaluation of practices in individualized schooling; and (8) completed projects. Also included are an author index, a numerical listing on reports/papers with ERIC Document (ED) numbers where available, and information on obtaining documents. (JD)

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BIBLIOGRAPHY OF PUBLICATIONS
1978 SUPPLEMENT

Wisconsin Research and Development Center
for Individualized Schooling

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Madison, Wisconsin

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- conducting and synthesizing research to clarify the processes of school-age children's learning and development
- conducting and synthesizing research to clarify effective approaches to teaching students basic skills and concepts
- developing and demonstrating improved instructional strategies, processes, and materials for students, teachers, and school administrators
- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

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WISCONSIN RESEARCH AND DEVELOPMENT
CENTER FOR INDIVIDUALIZED SCHOOLING

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HOW TO OBTAIN R & D CENTER DOCUMENTS

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A few items in this bibliography do not have ED numbers. Some of these are too recent to have been indexed in the ERIC system when this bibliography was printed. Most of them will have been indexed by the time you receive this. Check Resources in Education for the ED number.

BOOKS

The Wisconsin Research and Development Center for Cognitive Learning has a responsibility to ensure that the knowledge gained from its research, development, evaluation, and implementation activities is readily available to the education community. For this reason each major line of inquiry pursued at the Center is designed to culminate in the publication of a "milestone" document: a book, monograph, conference proceeding, or instructional material. Several monographs are scheduled for completion in 1978 in the areas of organization and administration of IGE schools, mathematics instruction, and concept development. The following books summarize and synthesize the work of Center associated faculty and other scholars related to the system of Individually Guided Education, cognitive learning and development, and peer tutoring.

Klausmeier, H. J., Rossmiller, R. A., & Saily, M. Individually guided elementary education: Concepts and practices. New York: Academic Press. 394 pp. $14.95.

Many elementary and middle schools across the country have recently changed to Individually Guided Education (IGE). Research and evaluation studies show that the teachers' own morale and the students' educational achievements are higher, and that the students' self-concept and attitudes toward learning are improved. This complete system for adapting instruction to meet the needs of individual children is a much-needed alternative to the age-graded, self-contained elementary school classroom, the departmentalized elementary school, and the unstructured, open classroom.

With Individually Guided Elementary Education: Concepts and Practices, students, teachers, and administrators now have an authoritative and comprehensive overview of this new system. It is written by 16 scholars, most of whom worked with the Wisconsin Research and Development Center for Cognitive Learning, local schools, state education agencies, and teacher-education institutions in developing and refining IGE. It is ideal both for a basic text in a credit course or noncredit staff development program dealing with IGE, and also for a second text in courses and programs dealing with elementary and middle school education.

The book covers in detail the components of IGE, and also provides an overview and history of IGE. In addition, it defines objectives for starting IGE schools and establishing IGE as a

focus for educational renewal, and guides readers to additional material with descriptions of a wide variety of print and audio-visual materials keyed to the chapters.

This book provides useful, how-to-do-it information for current and prospective teachers and administrators wishing to learn about IGE or adopt it for use in their schools. It will prove equally useful to the staffs of existing IGE schools in refining their practices. In addition to its value as a primary text for credit courses and noncredit staff development programs in IGE, it can serve as a second or supplementary text for courses and programs in particular aspects of individualization, such as individualized reading, mathematics, science, or social studies, and in courses on alternatives in education. Students, researchers, and teachers interested in curriculum and instruction, administration, or educational psychology at the elementary level will find the book's new perspectives and coverage invaluable for dealing with the reform and renewal of American education.

Klausmeier, H. J., & Allen, P. S. Cognitive development of children and youth: A longitudinal study. New York: Academic Press. In preparation.

An emerging theory of cognitive learning and development (CLD theory) has provided the impetus and theoretical framework for several interrelated areas of research carried out over the past few years at the Wisconsin Research and Development Center for Cognitive Learning. Cognitive Development of Children and Youth: A Longitudinal Study describes CLD theory, presents the major findings from three areas of research based on the theory, and relates the empirical evidence to existing knowledge about cognition and cognitive growth.

CLD theory is first elaborated and defined in light of current research and thinking about cognitive growth and specific cognitive processes such as attention, memory, and language. The major part of the book is devoted to presenting the methods and results of a longitudinal/cross-sectional study of cognitive development encompassing grades 1 through 12. These results are described in terms of sequencing and normative rates of development and individual differences in cognitive growth. The findings of the longitudinal study provide a comprehensive description of the course of cognitive growth during the critical years of schooling. Principles of cognitive development are presented, based on the research findings.

A second area of research based on CLD theory deals with the application of knowledge about cognitive learning and development to the design of instructional materials and classroom procedures to teach concepts, principles, and structures of

knowledge. Finally, instructional programming for the individual student is described as a research-based means of adapting schooling to nurture the cognitive development of each student.

These three closely related areas of research represent an integrated attempt not only to further our knowledge about cognitive development, but also to apply principles of cognitive learning and development to educational practices that will promote and sustain the cognitive growth of children and youth.

Levin, J. R., & Allen, V. L. Cognitive learning in children: Theories and strategies. New York: Academic Press. 1976. 314 pp. $17.50.

This book approaches children's learning in the classroom setting through a series of research projects carried out over the past ten years by investigators at the Wisconsin Research and Development Center for Cognitive Learning. The research reported in the book stresses an orderly progression from basic to applied research in education and offers a balance of theoretical and practical information on learning and development in children. The chapters dealing with basic cognitive processes in children include discussions of research projects on concept development, memory processes, visual imagery, intellectual abilities, and metaphor. Strategies for improving classroom instruction in schools are dealt with through more applied research on pre-reading skills, creativity training, cross-age tutoring, and the teaching of concepts.

Allen, V. L. Children as teachers: Theory and research on tutoring. New York: Academic Press. 1976. 290 pp. $14.00.

These well-integrated articles discuss current theory and research on peer tutoring, an increasingly important technique in the education of children. Eminent scholars from several disciplines have contributed the original chapters that make up the book. The secondary themes of cross-age interaction and helping relationships among children are prominent throughout the book. With its emphasis on the practical educational and psychological aspects of peer tutoring, Children as Teachers will be of great benefit to educational psychologists, child psychologists, social psychologists, educators, learning researchers, school psychologists, curriculum developers, and to students and workers in special education, social work, and related disciplines.

The first two sections of the book establish the basic theoretical and empirical foundations for practical programs discussed in later sections. A wide range of theoretical perspectives is offered, including historical background, role theory, ethological and cross-cultural considerations, and social skills

theory. Chapters in the second section present original research on social class and ethnic differences in tutoring by young children, teaching by siblings, nonverbal skills and consequences of tutoring for the tutor, and the use of a variety of non-professionals as helpers. The third section evaluates a wide range of tutoring programs currently operating in the schools. Authors of these chapters draw upon available research and their extensive practical experience to present the advantages and disadvantages of tutoring programs, and to discuss the important considerations that should be taken into account when developing tutoring programs in the school. Finally, two chapters of the book summarize an extensive amount of empirical research and practical experience relevant to tutoring programs in the school.

STUDIES OF INSTRUCTIONAL PROGRAMMING FOR THE INDIVIDUAL STUDENT

LONGITUDINAL STUDY OF CHILDREN'S CONCEPTUAL DEVELOPMENT

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TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

DiLuzio, G. J., Katzenmeyer, C. G., & Klausmeier, H. J. Technical manual for the conceptual learning and development assessment series I: Equilateral Triangle. Technical Report No. 434. (Formerly Working Paper No. 132) 5.1.10.80.01.01.01. 58 pp. December 1975. Reprinted December 1977.

This technical manual is one of three related publications to be used with the Conceptual Learning and Development Assessment Series I: Equilateral Triangle, a test constructed to chart the conceptual development of individuals. As a technical manual, it contains information on the rationale, development, standardization, and reliability of the test, as well as essential information and statistical data for evaluating the test.

This report is designed to be used by individuals who have a general knowledge of test construction and measurement principles and are aware of the limitations of test interpretations. The authors of this manual have attempted to take into account and satisfy the standards set forth by the American Psychological Association regarding educational and psychological tests.

An overview of the theoretical framework on which the test is based, a copy of the preliminary edition of the test battery, and directions for administration can be found in Technical Report No. 430, Development of Conceptual Learning and Development Assessment Series I: Equilateral Triangle (Klausmeier, Ingison, Sipple, & Katzenmeyer, 1973).

The most complete source of information regarding the theoretical framework on which the test is based is in Conceptual Learning and Development: A Cognitive View (Klausmeier, Ghatala, & Frayer, 1974).

DiLuzio, G. J., Katzenmeyer, C. G., & Klausmeier, H. J. Technical manual for the conceptual learning and development assessment series II: Cutting Tool. Technical Report No. 435. (Formerly Working Paper No. 139) 5.1.10.80.01.01.01. 56 pp. December 1975. Reprinted December 1977.

This technical manual is one of three related publications to be used with the Conceptual Learning and Development Assessment Series II: Cutting Tool, a test constructed to chart the conceptual development of individuals. As a technical manual, it contains information on the rationale, development, standardization, and reliability of the test, as well as essential information and statistical data for evaluating the test.

This report is designed to be used by individuals who have a general knowledge of test construction and measurement principles and are aware of the limitations of test interpretations. The authors of this manual have attempted to take into account and satisfy the standards set forth by the American Psychological Association regarding educational and psychological tests.

An overview of the theoretical framework on which the test is based, a copy of the preliminary edition of the test battery, and directions for administration can be found in Technical Report No. 431, Development of Conceptual Learning and Development Assessment Series II: Cutting Tool (Klausmeier, Bernard, Katzenmeyer, & Sipple, 1973).

The most complete source of information regarding the theoretical framework on which the test is based is in Conceptual Learning and Development: A Cognitive View (Klausmeier, Ghatala, & Frayer, 1974).

DiLuzio, G. J., Katzenmeyer, C. G., & Klausmeier, H. J. Technical manual for the conceptual learning and development assessment series III: Noun. Technical Report No. 436. (Formerly Working Paper No. 137) 5.1.10.80.01.01.01. 57 pp. December 1975. Reprinted December 1977.

This technical manual is one of three related publications to be used with the Conceptual Learning and Development Assessment Series III: Noun, a test constructed to chart the conceptual development of individuals. As a technical manual, it contains information on the rationale, development, standardization, and reliability of the test, as well as essential information and statistical data for evaluating the test.

This report is designed to be used by individuals who have a general knowledge of test construction and measurement principles are are aware of the limitations of test interpretations. The

authors of this manual have attempted to take into account and satisfy the standards set forth by the American Psychological Association regarding educational and psychological tests.

An overview of the theoretical framework on which the test is based, a copy of the preliminary edition of the test battery, and directions for administration can be found in Technical Report No. 432, Development of Conceptual Learning and Development Assessment Series III: Noun (Klausmeier, Ingison, Sipple, & Katzenmeyer, 1973).

The most complete source of information regarding the theoretical framework on which the test is based is in Conceptual Learning and Development: A Cognitive View (Klausmeier, Ghatala, & Frayer, 1974).

DiLuzio, G. J., Katzenmeyer, C. G., & Klausmeier, H. J. Technical manual for the conceptual learning and development assessment series IV: Tree. Technical Report No. 437. (Formerly Working Paper No. 138) 5.1.10.80.01.01.01. 54 pp. December 1975. Reprinted December 1977.

This technical manual is one of three related publications to be used with the Conceptual Learning and Development Assessment Series IV: Tree, a test constructed to chart the conceptual development of individuals. As a technical manual, it contains information on the rationale, development, standardization, and reliability of the test, as well as essential information and statistical data for evaluating the test.

This report is designed to be used by individuals who have a general knowledge of test construction and measurement principles and are aware of the limitations of test interpretations. The authors of this manual have attempted to take into account and satisfy the standards set forth by the American Psychological Association regarding educational and psychological tests.

An overview of the theoretical framework on which the test is based, a copy of the preliminary edition of the test battery, and directions for administration can be found in Technical Report No. 433, Development of Conceptual Learning and Development Assessment Series IV: Tree (Klausmeier, Marliave, Katzenmeyer, & Sipple, 1974).

The most complete source of information regarding the theoretical framework on which the test is based is in Conceptual Learning and Development: A Cognitive View (Klausmeier, Ghatala, & Frayer, 1974).

Klausmeier, H. J., Allen, P. S., Sipple, T. S., & White, K. M. First longitudinal study of attainment of the concept "Equilateral Triangle" by children age 5 to 16. Technical Report No. 425. (Formerly Working Paper No. 163) 5.1.10.80.01.01.01. 188 pp. in 2 parts. May 1976. Reprinted December 1977.

Theory and research regarding four levels of concept attainment and three uses of concepts as specified by the conceptual learning and development (CLD) model are described. The objectives and design of a four year longitudinal assessment program of children's conceptual learning and development are presented.

This study is the first report of descriptive data collected over the first two years of longitudinal assessment. These data were based on a single assessment battery, equilateral triangle, developed to determine each child's level of concept attainment and also the related use of the concept. The battery was designed as a paper-and-pencil task and was administered initially to 351 Beloit, Wisconsin, children who were in kindergarten, third, sixth, and ninth grades in 1973 and again when the same children were in first, fourth, seventh, and tenth grades in 1974. The battery was also administered to 160 children in a retest control group and 160 children in a cohort control group. Longitudinal data based on the equilateral triangle assessment battery were also collected in 1973 and 1974 from a smaller sample of 275 children in Watertown, Wisconsin.

Predictions, based on the model, focused on age changes in children's conceptual development. These predictions were strongly supported by both sets of longitudinal data.

Klausmeier, H. J., Allen, P. S., Sipple, T. S., & White, K. M. Third cross-sectional study of attainment of the concepts "Equilateral Triangle," "Cutting Tool," "Noun," and "Tree" by children age 7 to 17. Technical Report No. 427. (Formerly Working Paper No. 178) 5.1.10.80.01.01.01. 156 pp. November 1976. Reprinted December 1977.

Theory and research regarding four levels of concept attainment and three uses of concepts as specified by the Conceptual Learning and Development (CLD) model are described. The strategy and objectives of a longitudinal assessment of children's conceptual learning and development are presented. Perspective is provided regarding the role of cross-sectional investigations in the longitudinal assessment; design and results of the first and second cross-sectional research are reviewed.

For this study, the third in the cross-sectional series, four assessment batteries were used to determine each child's level of attainment and related use of the concepts equilateral triangle,

cutting tool, noun, and tree. Batteries were designed as paper-and-pencil tasks and were administered to from 325 to 332 children (depending on assessment battery) enrolled in each of four grades: second, fifth, eighth, and eleventh.

Predictions based on the model about children's conceptual development were strongly supported across concepts.

Klausmeier, H. J., Bernard, M., Katzenmeyer, C. G., & Sipple, T. S. Development of conceptual learning and development assessment series II: Cutting Tool. Technical Report No. 431. (Formerly Working Paper No. 120) 5.1.10.80.01.01.01. 87 pp. October 1973. Reprinted December 1977.

This technical report gives an overview of a model of conceptual learning and development (CLD model). The CLD model, in turn, provides the basis for assessing children's level of conceptual development. The assessment of the level of conceptual development requires assessment tools and procedures that may be used with children of about age 4 to 18. The second set of assessment exercises to assess children's level of attainment as well as use of the concept cutting tool is presented in this paper after a brief overview of the CLD model.

Klausmeier, H. J., Hooper, F. H., & Sipple, T. S. A preliminary report of the relationship between Piaget's and Klausmeier's measures of children's cognitive development. Technical Report No. 426. (Formerly Working Paper No. 169) 5.1.10.80.01.01.01. 159 pp. August 1976. Reprinted December 1977.

This paper presents the general purposes and orientation of a four-year longitudinal study of the relationships among children's conceptual learning and development as described by the Conceptual Learning and Development (CLD) model and the constructs and principles of Piagetian theory. The assessment instruments and procedures used with a sample of children aged 5 to 12 years are described. The CLD assessment batteries employed were designed to measure level of attainment and use of each of the concepts equilateral triangle, noun, and tree. The battery based upon Piagetian theory consisted of logical concept tasks assessing classificatory abilities, relational abilities, number concepts, and conservation abilities. In addition, three memory measures were selected.

Of the 180 children (60 at each grade: kindergarten, third, and sixth) tested in the initial year (1973) of the study, 156 children were available for longitudinal assessment 12 months later in 1974. The data collected over these first two years of longitudinal assessment on these 156 subjects are summarized and reported. Results of pass/fail contingency analyses relating performances on the various measures are given as well as results of correlational and factor analyses.

Klausmeier, H. J., Ingison, L. J., Sipple, T. S., & Katzenmeyer, C. G. Development of conceptual learning and development assessment series I: Equilateral Triangle. Technical Report No. 430. (Formerly Working Paper No. 119) 5.1.10.80.01.01.01. 79 pp. October 1973. Reprinted December 1977.

This technical report gives an overview of a model of conceptual learning and development (CLD model). The CLD model, in turn, provides the basis for assessing children's level of conceptual development. The assessment of the level of conceptual development requires assessment tools and procedures that may be used with children of ages 4 to 18. The first set of assessment exercises to assess children's level of attainment as well as use of the concept equilateral triangle is presented in this paper after a brief overview of the CLD model.

Klausmeier, H. J., Ingison, L. J., Sipple, T. S., & Katzenmeyer, C. G. Development of conceptual learning and development assessment series III: Noun. Technical Report No. 432. (Formerly Working Paper No. 121) 5.1.10.80.01.01.01. 91 pp. October 1973. Reprinted December 1977.

This technical report gives an overview of a model of conceptual learning and development (CLD model). The CLD model, in turn, provides the basis for assessing children's level of conceptual development. The assessment of the level of conceptual development requires assessment tools and procedures that may be used with children of ages 4 to 18. The third set of assessment exercises to assess children's level of attainment as well as use of the concept noun is presented in this paper after a brief overview of the CLD model.

Klausmeier, H. J., Marliave, R. S., Katzenmeyer, C. G., & Sipple, T. S. Development of conceptual learning and development assessment series IV: Tree. Technical Report No. 433. (Formerly Working Paper No. 126) 5.1.10.80.01.01.01. 131 pp. May 1974. Reprinted December 1977.

This technical report gives an overview of a model of conceptual learning and development (CLD model). The CLD model, in turn, provides the basis for assessing children's level of conceptual development. The assessment of the level of conceptual development requires assessment tools and procedures that may be used with children aged 4 to 18. The fourth set of assessment exercises to assess children's level of attainment as well as use of the concept tree is presented in this paper after a brief overview of the CLD model.

Mize, G. K., & Klausmeier, H. J. Factors contributing to rapid and slow cognitive development among elementary and high school children. Working Paper No. 201. 5.1.10.20.03.04.10. 263 pp. February 1977.

This paper identifies factors that seem to be differentially associated with rapid and slow conceptual learning. Also identified are factors that might be either preventable or most amenable to remediation. In these respects, the present investigation was regarded primarily as an hypothesis-generating study.

Sixteen children, eight sixth graders and eight twelfth graders, were identified as of rapid, average, or slow conceptual development. Both younger (sixth grade) and older (twelfth grade) children were included to ascertain whether or not conditions associated with rapid and slow development were consistent across this age span. In order to investigate a wide range of possible factors associated with extreme differences in rates of conceptual development, a methodology was required that permitted extensive and intensive exploration of those conditions. An individual case study approach was thought to be most compatible with the goals of the present research.

This research suggests that if greater emphasis for educating children were placed on the home environment and if the cooperative efforts of both parents and teachers working together could be successfully enlisted, then the learning experiences of many children might be altered. It is further contended that with increased parental cognizance of the educational process, rapport between home and school institutions would be greatly facilitated. These are clearly the major reinforcing environmental conditions affecting children's cognitive development.

A proposed educational intervention strategy model is presented focusing on the three major environmental aspects of children's lives--the home, the school, and the interaction between home and school.

Swinton, S. S., Sipple, T. S., Hooper, F. H., & Hougum, C. L. The role of short-term memory in the development of logical operations skills. Technical Report No. 445. 5.1.10.20.04.03.18. 33 pp. December 1977.

The study reported here attempted to statistically control the influence of one source of performance variance, short-term memory, to better describe the relationships among logical tasks due to other factors, including shared logical components.

The longitudinal interrelations among age, visual and auditory short-term memory, and the concrete operations period logical tasks of class inclusion and combinatorial reasoning were

investigated over four testing occasions in a sample of 134 children, initially ranging from 5 to 12 years in age.

Year four logical operations performances were predicted from earlier variables by means of multiple regression, yielding multiple correlations ranging in magnitude from .412 to .598. Memory variables were significant predictors of later logical task performance in all regressions except in that predicting final combinatorial reasoning status from year two data.

Two models (Kenny, 1973, 1975) were fit to the cross-lagged panel correlations resulting from the study. Both sets of assumptions led to the conclusion that one of the logical tasks, combinatorial reasoning, is a better predictor of short-term visual memory changes than the memory task is a predictor of combinatorial reasoning development.

These results suggest that visual memory should not simply be regarded as a source of performance or "nuisance" variance to be controlled in the investigation of logical operations development, but must be seen as an outcome rather than only a precondition for such cognitive restructuring.

DEVELOPMENTAL MEMORY AND CLASSROOM LEARNING

Faculty Associate:

C. Rayfield Haynes, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Haynes, C. R. Knowing and learning: A replication study of memory. Working Paper No. 225. 5.1.15.73.01.01. 11 pp. October 1977.

The present experiment was conducted to replicate the hypothesis that knowing and memory are related and to examine a mechanism of the hypothesis in relation to the serial position curve. Predictions of the hypothesis regarding both objectives were confirmed. Knowing was defined as the mean number of instances each subject was able to name in three mutually exclusive categories. Production time for each category was one minute. The mean number of instances that each subject produced across the three categories correlated significantly (Partial r = .95) with the number of instances the subject studied and recalled from a fourth category. Predictions regarding the hypothesis's assertion that the probability of recall of a given item depends less on its input position than on the item's shared commonality with a proposed internal memory mechanism, called mediation material, were confirmed.

LOGICAL CONCEPT DEVELOPMENT IN THE PRESCHOOL AND EARLY ELEMENTARY GRADES

Faculty Associates:

Frank H. Hooper, Department of Child and Family Studies
Joseph T. Lawton, Department of Child and Family Studies

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Ershler, J., McAllister, A., & Saunders, R. The Piagetian derived curriculum: Theoretical framework, preschool objectives, and program description. Working Paper No. 205. 5.1.20.22.01.01.07. 109 pp. May 1977.

This paper describes long-term educational goals and short-term preschool curriculum objectives derived from Piaget's theory of logical concept development. Specific preschool objectives address socio-emotional and cognitive development. Cognitive objectives are grouped according to physical knowledge, precursors of operative knowledge (infralogical and logico-mathematical) and figurative knowledge (representational and the special subclass of conventional knowledge). Also included is a description of the application of these objectives in the current University of Wisconsin Piagetian preschool program. Aspects discussed are physical and social environments, teacher role, and planning and scheduling of activities. Representative activities are also included for clarification.

Swadener, E. B., & Lawton, J. T. The effects of two types of advance organizer presentation on preschool children's classification, relations, and transfer task performance. Technical Report No. 446. (Ph.D. dissertation) 5.1.15.22.02.02. 187 pp. December 1977.

This study examined the effects of two types of advance organizer instruction, expository (EO) and guided self-discovery (GSDO), in teaching hierarchical classification or relations to preschool children. A control group was taught in a traditional manner by the regular teacher, using the same materials as the experimental groups. Each group received three 25-minute instructional sessions. Eight pre- and posttests measured spontaneous classification, class inclusion, additive seriation, and one-to-one

correspondence. Transfer tasks consisted of cross classification and cross seriation (in a 3 by 3 matrix), spontaneous classification and one-to-one correspondence problem solving tasks, and conservation of area and number.

Results indicated that both organizer groups outperformed the control group, and that performance by EO groups was significantly superior to GSDO.

Wanska, S. K. The relationship of the development of spatial concepts to the acquisition of locative meaning. Technical Report No. 415. (Ph.D. dissertation) 5.1.15.22.02.02.06. 166 pp. August 1977.

A cross-sectional study of children in the preoperations period was conducted to investigate, within the context of Piaget's theory, the patterns of developing cognitive abilities specifically in regard to: (a) the synchrony of infra-logical (spatial) operations and (b) the synchrony of infra-logical (spatial) operations and logical (classes, relations) operations. Also investigated were the potential constraints of spatial concept development on children's understanding of spatial preposition meaning.

It was concluded from the study that children demonstrate projective/Euclidean understanding before they comprehend the locatives, in front of and behind, in a projective/ Euclidean sense.

Wanska, S. K., & Lawton, J. T. A replication and expansion of the use of advance organizers in facilitating learning for children. Working Paper No. 210. 5.1.20.22.01.01.04. 152 pp. July 1977.

The effects of three types of advance organizer lessons, containing high-order social studies concepts (AO1), high-order rules for hierarchical classification (AO2), or both (AO3), on the learning of social studies concepts and hierarchical classification (as defined by Piaget) were evaluated for a sample of 237 rural children in kindergarten, third, and fifth grades.

The study consisted of two main phases, each having a pretest, an instructional session, and a posttest. The experimental design also included a delayed posttest and far transfer task (Phase 3). All testing was done individually and all lessons were taught to groups of 7 to 10 children. The task battery included spontaneous classification, some/all, class inclusion, and multiplicative classification. The results indicated a superior training effect in favor of the AO lessons in which high-order content and process concepts were combined.

TEACHING BASIC CONCEPTUALIZING SKILLS IN ACCORDANCE WITH INSTRUCTIONAL PROGRAMMING FOR THE INDIVIDUAL STUDENT

Faculty Associate:

Herbert J. Klausmeier, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Klausmeier, H. J., DiLuzio, G. L., & Brumet, M. L. First year intervention study to facilitate children's concept learning. Technical Report No. 424. (Formerly Working Paper No. 159) 5.1.10.80.01.01.01. 126 pp. March 1976. Reprinted December 1977.

Theory and research regarding four levels of concept attainment and three uses of concepts as specified by the conceptual learning and development (CLD) model are described. The strategy of a longitudinal intervention study is detailed. This study is designed to determine the effects of implementing both the model of instructional programming for the individual student (IPM) and specially prepared lessons based on the CLD model. These lessons were designed to teach the process-concepts of science that are incorporated in the curricular program Science: A Process Approach. The results of a short-term experiment conducted to assess the effectiveness of a lesson on the process-concept observing scientifically are also reported.

Klausmeier, H. J., Sipple, T. S., Swanson, J. E., & Schilling, J. M. Second-year intervention study to facilitate children's concept learning. Technical Report No. 429. (Formerly Working Paper No. 193) 5.1.10.80.01.01.01. 95 pp. December 1976. Reprinted December 1977.

Theory and research regarding levels of concept attainment and uses of concepts as specified by the conceptual learning and development (CLD) model are briefly described. The purpose and strategy of a longitudinal intervention study are detailed. This intervention study is designed (1) to determine the effects of specially prepared lessons on students' learning of key process-concepts of science, (2) to determine the effects of instructional programming for the individual student on achievement of the science content of a published science program (Science: A Process Approach [SAPA]), and (3) to determine the effects of the combined

intervention treatments on students' attitudes toward their science instruction. Procedures for analyzing the process-concepts are given as well as for developing the process-concept lessons. Results obtained in the second year of the study are reported for each of the dependent measures. In general, the mean gain scores of the experimental schools were significantly higher than those for control schools on tests of the specific content of the SAPA curriculum. Results also showed scores on assessments of the science process-concepts to be generally higher for the treatment group in comparison with the control. In addition, results of a science attitude inventory are reported. Finally, plans for continuing use of process-concept lessons and for more fully differentiated instruction during successive semesters of the study are discussed.

Klausmeier, H. J., Swanson, J. E., & Sipple, T. S. The analysis of nine process-concepts in elementary science. Technical Report No. 428. (Formerly Working Paper No. 180) 5.1.10.80.01.01.01. 103 pp. October 1976. Reprinted December 1977.

Theory and research background regarding the teaching of concepts are presented. Procedures are given in detail on how a concept can be analyzed in order to aid in teaching and preparing instructional materials. Nine processes of science drawn from a published elementary science curriculum (Science: A Process Approach) are treated as concepts and analyzed. The process-concepts are Observing, Inferring, Predicting, Classifying, Measuring, Using Numbers, Using Space/Time Relationships, Communicating, and Controlling Variables. Each process-concept is analyzed in terms of its definition, defining and variable attributes, examples and nonexamples, related principles, sample problems, and key vocabulary.

Mize, G. K. The influence of increased parental involvement in the educational process of their children. Technical Report No. 418. (Ph.D. dissertation) 5.1.20.25.01.01.16. 238 pp. August 1977.

The major focus of this study was to assess the effect of increased parental involvement in an intervention program. These evaluations were made in terms of behavioral and attitudinal changes observed in the participating parents, teachers, and children. Child variables that were assessed included the child's (1) level of self-esteem, (2) motivation to learn, (3) academic attitudes toward reading, teacher, school, and learning, and (4) reading achievement.

In the intervention program, principles and procedures from two training programs were integrated into a unified program for parents to use with their children. These programs were

(1) the Individually Guided Motivation (IGM) system and (2) the Systematic Training for Effective Parenting (STEP) program.

The results of this research study suggest that the relationships between the family and school environments warrant further emphasis by those involved with the education of children.

Swanson, J. E. The effects of adapting elementary science instruction to students' entering achievement levels. Technical Report No. 417. (Ph.D. dissertation) 5.1.20.25.01.01.15. 183 pp. August 1977.

This study investigated the effects of adapting elementary science instruction to students' entering achievement levels on three dependent variables: performance on tests of science content, mastery of lesson objectives, and attitude toward science. The subjects were 235 sixth grade children from four elementary schools in a small, mid-western industrial city.

Two experimental and two control schools provided a 10-week instruction period on six lessons from the Science: A Process Approach (SAPA) curriculum. The results showed no significant difference in achievement between low students receiving differentiated instruction in relatively homogeneous groups (experimental condition) and low students receiving non-differentiated instruction in relatively heterogeneous classrooms (control condition).

ANALYSIS OF CROSS-AGE TUTORING PROCESSES

Faculty Associate:

Vernon L. Allen, Department of Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Allen, V. L., & Atkinson, M. L. Intentional and nonintentional encoding of nonverbal behavior by high- and low-achieving children. Working Paper No. 208. 5.1.20.30.08.01.09. 41 pp. July 1977.

Forty adult observers viewed silent video tapes of a sample of 16 male and female children from grades four and five. Observers estimated the level of understanding a lesson revealed by each child after viewing each target person for 2.5 minutes. Results showed that observers were able to accurately differentiate a child's understanding or not understanding of a lesson in spontaneous and role play conditions. In the spontaneous condition, females were perceived as understanding more than males on both the easy and difficult lessons. The high achievers were uniformly perceived as understanding more than the low achievers. The obtained differences in perceived understanding as a function of sex and achievement level did not appear when the children were role playing. This indicates that results for spontaneous behavior are not due to some of the children having a different set of role expectations or being deficient in the ability to produce the appropriate nonverbal cues.

Allen, V. L., & Moldawsky, L. Nonverbal correlates of empathy. Working Paper No. 215. 5.1.20.30.08.01.10. 25 pp October 1977.

This study investigated nonverbal behavior occuring under different types of empathy. Forty-four female introductory psychology students observed a video tape of a young boy participating in a spelling exercise. Four different experimental conditions were created: affective (empathy with regard to the feelings of the young boy in the video tape), cognitive (empathy with regard to the young boy's thoughts), teacher (empathy with regard to the teacher in the video tape), and control (objective viewing of the video tape). While the subjects were observing the stimulus person, their nonverbal responses were recorded on video tape. Results did not

reveal any significant differences among experimental conditions in the frequency of imitation of nonverbal behavior exhibited by the stimulus person. However, some types of nonverbal behaviors were imitated significantly more often than other types.

Allen, V. L., & Plazewski, J. G. Two studies on the nonverbal behavior of tutees as a function of accessibility and salience of nonverbal communication from the tutor. Working Paper No. 199. 5.1.20.30.08.01.08. 60 pp. February 1977.

Two experiments investigated the nonverbal behavior of tutees in a cross-age tutoring situation. In the first experiment 36 third grade tutees were video taped while learning a concept formation task from an older tutor. In the first condition, a physical barrier prevented nonverbal communication between tutor and tutee; in the second condition, natural face-to-face nonverbal communication prevailed; and in the third condition nonverbal communication was accentuated by appropriate instructions. A trained observer coded the video tapes for the frequency of occurrence of 20 categories of nonverbal behavior by the tutee. Significant differences were found on seven nonverbal categories. A second experiment investigated observers' impressions of tutees on the basis of their nonverbal cues available from the video tapes. With the exception of females in cross-sex dyads, tutees created more negative impressions in the barrier condition than in the two face-to-face conditions. Moreover, the observers were less accurate concerning the tutees' cognitive and affective reactions to the lesson in the barrier condition than in the face-to-face conditions. Results of experiment 2 suggest that there were important differences in the structure of the nonverbal behavior of tutees as a function of the availability and salience of nonverbal cues emanating from the tutor.

Plazewski, J. G., & Allen, V. L. The paralinguistic encoding capability of children. Technical Report No. 441. 5.1.15.30.01.01.03. 66 pp. December 1977.

This study was conducted to ascertain the capacity of sixth grade children to accurately communicate paralinguistic affect. The dependent measure indicating the accuracy of paralinguistic communication of affect was obtained by comparing the level of affect which children intended to encode with ratings of vocal inflections from adult judges. Four independent variables were manipulated: (1) the encoder's sex (male/female), (2) the literal content of the child's verbal message (positive/negative), (3) the encoder's intended level of vocal intonation (extremely unfriendly, moderately unfriendly, neutral, moderately friendly, and extremely friendly), and (4) the sex of the adult decoder who provided ratings of conveyed vocal affect (male/female). The results indicated that male children were more accurate encoders than female children, and adult females were more accurate decoders than adult males. Findings are discussed in light of the role of physiological arousal in affecting motor performance according to learning theory.

SOCIAL PSYCHOLOGICAL PROCESSES ASSOCIATED WITH LEARNING EFFECTIVELY IN SMALL GROUPS

Faculty Associate:

Vernon L. Allen, Department of Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Allen, V. L., & Atkinson, M. L. Identifying spontaneous and deliberate behavior from nonverbal responses. Technical Report No. 419. 5.1.15.30.01.01.04. 33 pp. December 1977.

Observers viewed silent video tapes of elementary school children listening to a lesson. Some of the stimulus children were listening to either a very easy or a very difficult lesson; consequently, their nonverbal behavior occurred naturally and spontaneously. Other stimulus children were instructed to pretend (role play) that they understood or did not understand the lesson; thus, their nonverbal behavior was deliberate or intentional. Observers were required to judge whether each stimulus person's behavior was spontaneous or deliberate. Results indicated that observers did significantly differentiate between spontaneous and deliberate behavior on the basis of facial responses alone. The findings are related to Ekman and Friesen's analysis of deception, and are interpreted in terms of information theory.

Allen, V. L., & Brideau, L. B. The ability of parents to decode nonverbal behavior of their own and other children. Technical Report No. 444. 5.1.15.30.01.01.01. 28 pp. December 1977.

A study was designed to investigate the ability of parents to decode the nonverbal behavior of their own and other children. It was predicted that parents would be more accurate in decoding the nonverbal behavior of their own child than of another child. Parents were asked to identify children's mode of encoding (natural/role play) and level of comprehension (understanding/not understanding). Results supported the hypothesis for level of comprehension: that is, parents were more accurate in decoding understanding or not understanding with their own child than with another child. But the hypothesis was not supported for decoding mode of encoding (natural/role play). In this case, the decoding accuracy of parents was similar with their own and with another child. A second study tested the role of familiarity by comparing children's accuracy in decoding their own and another child's nonverbal behavior. Results showed a similar level of decoding accuracy for self and for another child.

Atkinson, M. L., & Allen, V. L. The generality-specificity of encoding and decoding skills with spontaneous and deliberate nonverbal behavior. Technical Report No. 443. 5.1.15.30.01.01.05. 35 pp. December 1977.

This experiment was designed to investigate the generality-specificity of the accuracy of both encoders and decoders across different types of nonverbal behavior. It was expected that encoders and decoders would exhibit generality in their behavior--that is, the same level of accuracy--on the dimension of behavior content (comprehension/noncomprehension). Less generality of accuracy was expected on the dimension of mode of behavior (spontaneous/role play). Contrary to predictions, results indicated a high degree of specificity across both content and mode of behavior when the data were analyzed separately for encoders and decoders. These findings seriously question the conclusion of previous reports suggesting high generality in the encoding and decoding of nonverbal behavior. Instead, individuals appear to be quite situation-specific in their ability to encode and decode nonverbal behavior. A theoretical interpretation of the results was offered.

INSTRUCTIONAL PROGRAMMING FOR THE INDIVIDUAL STUDENT IN INDIVIDUALLY GUIDED SECONDARY EDUCATION

Faculty Associate:

Herbert J. Klausmeier, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Klausmeier, H. J. Principals' ratings of the desirability of the comprehensive and enabling objectives for Individually Guided Education/Secondary. Working Paper No. 207. 5.1.15.25.01.01. 22 pp. July 1977.

Principals of innovative middle and/or junior high schools and senior high schools, and other persons were invited to attend the 1977 Workshop on Educational Reform and Renewal Through Individually Guided Secondary Education. They discussed the formulation of Individually Guided Education and responded to an instrument designed to obtain their judgments regarding the desirability of implementing 75 enabling objectives to achieve major comprehensive objectives related to 8 components of a complete system of individualized secondary schooling. On a 1 to 6 scale, with 6 being high, the mean ratings for the 8 components for the 3 groups ranged from 5.08 to 5.75. The reliability coefficient of the instrument was .97. Based on the high and reliable ratings, it is inferred that Individually Guided Secondary Education as described by the comprehensive and enabling objectives is a desirable type of individualized secondary schooling and that it can serve effectively as a beginning point for cooperative research and development between the R & D Center and innovative schools that are attempting to meet the needs of individual students.

Klausmeier, H. J. 1977 workshop on educational reform and renewal through Individually Guided Secondary Education. Objectives of IGE/Secondary: A focus for cooperative reform and renewal efforts. Working Paper No. 206. 5.1.15.25.01.01. 35 pp. July 1977.

This paper presents a preliminary definition of Individually Guided Secondary Education. Comprehensive objectives are stated

for the following five phases of an implementation sequence: awareness, commitment, changeover, refinement, and renewal. Detailed enabling objectives are stated for the changeover phase which, with the comprehensive objective for changeover, describe Individually Guided Secondary Education. This initial formulation of Individually Guided Secondary Education is related to the second-generation formulation of Individually Guided Elementary Education and to recent reports regarding the chronic failure of current secondary schools to adapt instruction to the characteristics of individual students and to meet modern societal demands to facilitate the transition from childhood to adulthood.

Lehr, J., & Teicher, B. Features of successful secondary schools: Associated network of IGE middle, junior, and senior high schools and other schools with innovative programs, 1977-78. Working Paper No. 224. 5.1.15.25.01.01. 24 pp. December 1977.

This paper presents features of successful secondary schools. Included are 24 middle and/or junior high schools and 23 senior high schools. These schools form the Associated Network of IGE Junior, Middle, and Senior High Schools and other schools with innovative programs for 1977-1978.

STUDIES OF ADMINISTRATION AND ORGANIZATION FOR INSTRUCTION

COMPUTER SUPPORT FOR INDIVIDUALIZED INSTRUCTION

Faculty Associate:

Donald M. McIsaac, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Bozeman, W. C., Donnelly, R. A., & Gaddis, M. T. Wisconsin System for Instructional Management: Teachers' manual for the unified system. Practical Paper No. 18. 5.2.73.80.11.01.01. 65 pp. November 1977.

This manual promotes and facilitates effective and efficient use of the Unified Wisconsin System for Instructional Management (WIS-SIM) by teachers and other instructional personnel. The manual assumes no knowledge of data processing or computer technology. It is not a technical document and few technical terms are used. If additional system operating specifications are desired, the reader is referred to the System Design Manual for the Unified WIS-SIM (1977) or the WIS-SIM Terminal Operator Manual (1977). Additional sources are also provided in the reference section of this manual.

Bozeman, W. C., Gaddis, M. T., Donnelly, R. A., & Wende, J. L. Wisconsin System for Instructional Management: Terminal operator manual. Practical Paper No. 19. 5.2.73.80.11.01.01. 99 pp. December 1977.

This manual facilitates the use of the Unified Wisconsin System of Instructional Management. The manual specifically addresses the needs of the computer terminal operator as opposed to those of systems personnel, teachers, or unit leaders. However, it is recommended that everyone involved in a computer-managed instruction environment have some familiarity with the contents of this guide.

The General Electric TermiNet computer terminal and the Madison Academic Computing Center (MAAC) are the hardware sources for this manual, although the system is not specifically limited to these sources. School districts utilizing different hardware will require a modified manual.

This document should not be considered a technical manual. If additional system operating specifications are desired, the reader is referred to the System Design Manual for the Unified Wisconsin System of Instructional Management (WIS-SIM) (1977), and appropriate MACC user manuals (e.g., MACC Timesharing Guide).

Spuck, D. W., Bozeman, W. C., & Lawrence, B. F. Evaluation of the Wisconsin System for Instructional Management (WIS-SIM Pilot Test). Technical Report No. 438. 5.2.73.60.02.01. 211 pp. November 1977.

The Wisconsin System for Instructional Management (WIS-SIM) is designed to provide record keeping and management support for programs of Individually Guided Education. This paper reports the results of a two-year pilot test of the implementation of WIS-SIM in seven Wisconsin elementary schools. The evaluation design includes consideration of system functioning, utilization, and effects, based on perceptual and judgmental information supplied by users, as well as actual data collected on system operation.

Examined was the presumed effect that WIS-SIM had on the allocation of teacher time to clerical, planning, and instructional activities. The evidence suggests a reduction in the amount of time required for clerical tasks. Teachers expressed that the number of hours spent on planning had not changed, but that the effectiveness of time spent on planning had increased. Student achievement demonstrated an increasing trend, but neither the changes in teacher time on activities nor the changes in student achievement can be directly attributed to WIS-SIM implementation because of design limitations. Teachers in schools where the system was used reported very positive attitudes toward the system and its effects.

Recommendations are included concerning site selection, staffing, and inservice and system implementation. The evaluation framework used for this study is reviewed as a basis for future research and evaluation studies on management information systems. The study concludes that the majority of objectives and design goals have been attained. The pilot test of WIS-SIM is important as a proof of the concept of instructional management information systems but does not provide strong evidence that this system is cost effective in improving educational outcomes.

SYSTEM DESIGN MANUALS

Chan, N. C., Douglas, B. G., Belt, S. L., McNamara, J. R., & Winkler, L. J. System Design Manual for the Wisconsin System of Instructional Management (WIS-SIM) for the Management of Developing Mathematical Processes (DMP). 5.2.73.30.30. 477 pp. June 1977.

This manual presents overviews of computer managed instruction, DMP, the functional capabilities of WIS-SIM/DMP generation and software organization. A detailed discussion is provided regarding software for report generation, file updating, and interactive interface with terminals. A complete listing of all programs is also included.

Chan, N. C., Douglas, B. G., Belt, S. L., McNamara, J. R., & Winkler, L. J. System Design Manual for the Wisconsin System of Instructional Management (WIS-SIM) for the Management of Science. . .A Process Approach (SAPA). 5.2.73.30.30. 477 pp. June 1977.

This manual provides an overview of computer managed instruction as well as a description of WIS-SIM and SAPA. Procedures related to system capabilities are outlined including data base initialization and updating, curriculum overlap, and system commands. Complete documentation of the processor software is provided including program descriptions, files and devices, and interactive function codes.

Douglas, B. G., & Belt, S. L. System Design Manual for the Wisconsin System of Instructional Management (WIS-SIM) for the Management of the Wisconsin Design for Reading Skill Development (WDRSD). 5.2.73.30.30. 197 pp. June 1977.

This manual discusses computer managed instruction, individualized education, and the areas of WDRSD supported by WIS-SIM. The capabilities of the software for entering information into the data base, generating reports, and providing grouping information for instructional decision-making are detailed. Documentation also is provided on program listings and descriptions, and the interactive function codes.

Douglas, B. G., Belt, S. L., Owen, S. P., & Chan, N. C. System Design Manual for the Unified Wisconsin System of Instructional Management (WIS-SIM). 5.2.73.30.30. 774 pp. June 1977.

This manual is intended for computer programmers and analysts who are responsible for implementing the Unified WIS-SIM. Included in the manual are discussions of individualized education, system specifications, processor specifications, front-end specifications, utility programs, and program listings (bound separately).

ORGANIZATION OF THE SCHOOL FOR INDIVIDUALIZED INSTRUCTION

Faculty Associate:

James M. Lipham, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Davis, K. P. Perceived role and effectiveness of school psychologists in IGE schools. Technical Report No. 442. (Ph.D. dissertation) 5.1.30.20.02.01.07. 166 pp. December 1977.

The purposes of this study were: (1) to determine if differences exist in role expectations held for school psychologists in conducting their functions on the part of principals, unit leaders, teachers, and school psychologists in IGE schools; (2) to determine the relationship between agreement on expectations and ratings of the performance effectiveness of school psychologists; and (3) to determine relationships between the performance effectiveness of school psychologists and several organizational variables. The conceptual and theoretical foundations for the study were social systems theory and role theory.

The School Psychologist Role Analysis (SPRA) was pilot tested for validity and reliability and the final instrument contained tasks for these functions of the school psychologist: consultant, diagnostician, therapist, educational programmer, and researcher roles.

Feldman, R. H. Involvement in and satisfaction with decision making related to staff and student behavior in IGE schools. Technical Report No. 408. (Ph.D. dissertation) 5.1.30.20.02.01.04. 162 pp. January 1977.

This study examined the assumption that teacher involvement in and satisfaction with decision making were systematically related to organizational effectiveness criteria of teacher job satisfaction, student achievement in reading and mathematics, and student affective behavior in multiunit elementary schools that have implemented Individually Guided Education (IGE). This study included theoretical and conceptual foundations for general systems theory, social systems theory, and decison theory.

The conclusions were: (1) Unit teachers' perceptions of the extent of involvement in decision making were systematically and significantly

related to teacher job satisfaction. (2) Unit teachers' perceptions of the extent of involvement in decision making were not systematically and significantly related to student achievement in reading, mathematics, or student affective behavior. (3) Unit teachers' perceptions of satisfaction with decision making were systematically and significantly related to teacher job satisfaction. (4) Unit teachers' perceptions of satisfaction with decision making were not systematically and significantly related to student achievement in reading, mathematics, or student affective behavior.

Kawleski, S. J. Decision making of the instruction and research unit in IGE schools: Functions, processes, and relationships. Technical Report No. 420. (Ph.D. dissertation. 5.1.30.20.02.01.06. 299 pp. October 1977. ED 145 564.

This study investigated the functions, processes and relationships of shared decision making in Instruction and Research (I & R) Units in IGE elementary schools. The theoretical foundations included IGE, social systems, group dynamics, leadership and decision theories. Field methodology was employed to examine 16 I & R Units of 8 established IGE schools.

Mendenhall, D. R. Relationship of organizational structure and leadership behavior to staff satisfaction in IGE schools. Technical Report No. 412. (Ph.D. dissertation) 5.1.30.20.02.01.03. 222 pp. March 1977. ED 145 562.

The purposes of this study were: (1) to determine the relationship of the structural aspects of organization and leadership behavior within the organization to the organizational outcome of job satisfaction in IGE schools, and (2) to determine the strength of impact of the organizational structure or leadership behavior on job satisfaction in IGE schools. The conceptual and theoretical foundations for the study were the theories of general systems, social systems, organization, and leadership.

The major conclusions were: (1) There were relationships between organizational structure and job satisfaction; (2) there were relationships between leader behavior and job satisfaction; (3) organizational structure and leader behavior did not account for an equal amount of variance in job satisfaction.

Moyle, C. R. J. Decision making of the instructional improvement committee in IGE schools: Functions, processes, and relationships. Technical Report No. 416. (Ph.D. dissertation) 5.1.30.20.02.01.05. 293 pp. September 1977.

The purpose of this study was to observe and describe the functions, processes, and dynamics of group decision making in the Instructional Improvement Committee (IIC) in IGE elementary schools. The theoretical

foundations included IGE, social systems, group dynamics, leadership and decision theories. Field methodology was employed to examine eight established IGE schools. Data collected through interviews, observations, and questionnaires were analyzed by and across schools according to the responses of the staff and based on field notes and observations.

Venezky, R. L. Observation and recording of educational activities as an aid to school design. Technical Report No. 391. 5.1.30.10.10.02. 42 pp. December 1976.

The development of new instructional organizations has placed demands on school facilities which cannot be met adequately with the procedures currently used for school design. Organizational methods, for example, which stress small-group and individual work in non-age-graded settings are not accommodated easily by either of the two common forms of school structures in the United States--the closed-classroom, eggcrate design, or the large, open pod design. To improve the design of school facilities, a recording technique has been developed for gathering information on educational activities. A floor plan of a school which shows all areas that are potentially usable for school activities is labeled and the major characteristics of the spaces, including equipment, are recorded. For each activity observed, the location, duration, and equipment used are recorded, along with the type of activity and certain characteristics of the students and instructor. These data are then analyzed to yield information on instructional patterns, space and facility requirements, and student circulation.

COST EFFECTIVENESS OF INDIVIDUALIZED SCHOOLING

Faculty Associate:

Richard A. Rossmiller, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Rossmiller, R. A., & Geske, T. G. Resource allocation and time utilization in IGE and non-IGE schools. Technical Report No. 410. 5.1.30.30.03.01.01. 76 pp. January 1977. ED 140 490.

This study examined the cost implications of implementing and operating the IGE/MUS-E school, and also examined how instructional personnel spend their time in IGE schools. The study addressed two basic questions: (1) Do IGE schools cost more or exhibit different expenditure patterns from non-IGE schools? (2) Do instructional personnel in IGE schools allocate their time differently from instructional personnel in non-IGE schools?

Two instruments--the School Expenditure Data form and the Time Allocation of Instructional Personnel form--were developed and used to collect data for this study.

It was concluded that: (1) IGE schools do not cost more than non-IGE schools. (2) IGE teachers devoted significantly more time to one-to-one instruction, and significantly less time to large group instruction than did non-IGE teachers. (3) Principals in IGE schools devoted less time to non-instructional activities than did non-IGE principals.

Rossmiller, R. A., & Geske, T. G. Economic analysis of education: A conceptual framework. Theoretical Paper No. 68. 5.1.30.30.01.01.01. 72 pp. October 1977.

This paper presents a conceptual framework for analyzing the complex relationships between school inputs and school outcomes and for conducting cost-effectiveness studies in education. The paper discusses several concepts and techniques from the areas of systems theory and economic analysis that can be used as tools in an effort to improve the productivity of the educational enterprise. In addition, the use of basic planning-programming-budgeting procedures is recommended to facilitate cost-effectiveness analyses.

Several studies investigating productivity in education are reviewed and the analytical problems in conducting cost-effectiveness studies are explored. The paper points out the potential pitfalls in identifying, measuring, and comparing program costs and addresses the difficulties inherent in assessing program outcomes. Several conceptual models designed for conducting cost-effectiveness studies in education are discussed and the results of a number of empirical investigations employing cost-effectiveness techniques are presented.

The conceptual framework developed in this paper views the education production process as a system consisting of four major components: (1) system environment and controls, (2) the school, (3) outputs of schooling, and (4) feedback. The first component includes socioeconomic variables that have been shown to influence school outcomes and the policy framework within which schools operate. The second component, the school system itself, includes two major elements: (1) school resource inputs--the human resources (students and professional staff) and the material resources (physical plant, classroom equipment, and curricular products), and (2) school resource applications--the manner in which school resources are combined or mixed to achieve designated objectives. The outputs of an educational system may be classified in several ways, e.g., short-range and long-range, cognitive and noncognitive, or monetary and nonmonetary. The fourth component is feedback based on evaluation of the system's outputs.

STUDIES OF THE ROLE OF SPECIALIST TEACHERS IN IGE SCHOOLS

Faculty Associate:

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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Forrest, R. E. Role behaviors of staff teachers in IGE schools utilizing two different staffing arrangements for art, music, and physical education programs. Technical Report No. 439. (Ph.D. dissertation) 5.1.30.40.01.01.03. 154 pp. November 1977.

This study examined the role expectations and role adequacy of classroom teachers in art, music, and physical education programs in selected IGE schools. Also examined were teachers' perceptions of specialists' roles. It was posited that no significant differences would emerge as a function of staffing arrangements utilizing specialist teachers or consultants, or as a function of subject area. Role theory provided the theoretical basis for the study.

STUDIES OF HOME-SCHOOL-COMMUNITY RELATIONS IN IGE SCHOOLS

Faculty Associate:

B. Dean Bowles, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Karges, M. L. The implementation, evaluation, and refinement of the home-school-community relations interaction model. Technical Report No. 414. (Ph.D. dissertation) 5.1.30.50.01.02.10. 353 pp. July 1977.

This study was designed to implement the school-community relations model of interaction to determine whether the specified patterns and processes were viable. Refinements were to be made in the model on the basis of the results of model implementation.

Evaluation data indicated that it is possible for a school to implement the school-community relations interaction processes and to establish a program of school-community relations. Informal observation revealed that the presence of the project coordinator raised the awareness of the staff to school-community relations. In addition, the success of staff members in implementing new ideas convinced other members of the staff to become involved in school-community relations.

Liechty, T. A. Patterns of citizen participation in education. Technical Report No. 411. (Ph.D. dissertation) 5.1.30.50.01.02.02. 313 pp. March 1977. ED 145 561.

This study examined the nature of citizen participation in education. A questionnaire was developed to assess both the kinds of educational activity in which citizens participated and the selected primary personal variables. The general purposes of this assessment were (1) to describe the frequency, distribution, and modes of educational participation and to identify types of participators; (2) to secure data related to these types of participators, including educational awareness, specific attitudes toward participation, generalized attitudes toward political, social, and educational concerns, and socio-economic variables; and (3) to correlate these primary personal variables with identified types of educational participators.

SIMFORMATIONS: MATERIALS FOR HOME-SCHOOL-COMMUNITY RELATIONS

A major task of the Home-School-Community Relations Project is to develop materials which are useful to school staff members, particularly principals and unit leaders. These materials--called simformations, from information and simulation--center around activities which can contribute to effective home-school-community relations programs. They provide information on various topics and opportunities for participation in learning experiences.

Klenke, W. H., Moser, R., & Fruth, M. J. Simformation 1: Introducing Parents to the Wisconsin Design for Reading Skill Development.

This simformation is designed to introduce parents to the Wisconsin Design and to open communications between the school and the community. Beginning with an activity which helps staffs identify parent needs related to the Design, the simformation continues with a plan for a school-community meeting in which participants take the part of children and are introduced to the Design as part of a reading class. The simformation concludes with a series of follow-up interviews with community members.

Bartels, L. I. Simformation 2: A Guide to Organizing a Volunteer Program in IGE Schools.

This simformation discusses the rationale for a volunteer program as part of a larger home-school-community relations program. Included are "how to" ideas for program planning which range from conducting a needs assessment through coordination and evaluation of a volunteer program. Emphasis is on the volunteer-teacher relationship with suggested activities for the orientation and training of each.

Raskas, H. I. Simformation 3: Home-School Visits.

As a means of improving communication between the home, school, and community and to increase the involvement of the school community in the school's program, this simformation covers visits by a staff member to individual homes and small groups and visits by individual community members to the school. Group meetings at the school are also discussed. Sample letters to parents and suggestions for creating a school handbook are included in the appendix.

Miles, W. R. Simformation 5: Reporting Pupil Progress.

The purposes of this simformation are to consider alternative ways to report pupil progress through written means and to consider the process a school or district can follow in changing its current reporting system. A discussion of the goals of a reporting program and examples of actual forms are included.

Cooper, R. J., Maier, M., & Karges, M. L. Simformation 6: Planning, Conducting, and Evaluating Parent-Teacher Conferences.

This simformation provides principals, unit teachers, and teachers with specific recommendations for holding successful parent-teacher conferences. It highlights the necessity for resolving the differing expectations parents and teachers may bring to the conference and suggests specific involvement and two-way communication techniques for facilitating mutually satisfying and productive sessions.

The simformations are available from the CCL Document Service, 1025 W. Johnson St., Madison, WI 53706. Write for price information.

LANGUAGE: READING AND COMMUNICATION

INFORMATION PROCESSING IN READING

Faculty Associate:

Dominic W. Massaro, Department of Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Massaro, D. W. Reading and listening. Technical Report No. 423. 5.1.50.20.02.01.12. 63 pp. December 1977.

Reading text and listening to speech involve a series of processes that take the language user from the written and spoken message to meaning. Our goal is to describe in detail each of the processes in an information processing model. The temporal course of audible and visible language processing is analyzed as a sequence of processing stages. At each stage of the model, there are structural and functional components. The structural component represents the information available at that stage of processing. The functional component specifies the procedures and processes that operate on the information held in the corresponding structural component. The model is used heuristically to incorporate data and theory from a variety of approaches to reading and speech perception. One central assumption of this approach is that analogous structures and processes occur in reading and listening. It is valuable, therefore, to ask similar experimental questions in both areas and to attempt to develop a coherent model of both reading and listening processes. We are concerned with the properties of the various storage structures, the dynamics of the functional processes, and the active utilization of the various sources of knowledge available to the language receiver.

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CHILDREN'S PROSE LEARNING

Faculty Associate:

Joel R. Levin, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Bender, B. G., & Levin, J. R. Strategies in reading comprehension: VIII. Pictures, imagery, and retarded children's story recall. Working Paper No. 214. 5.1.50.35.01.01.03. 17 pp. September 1977.

Ninety six educable mental retardates, ages 10 to 16 years, were randomly assigned to one of four experimental conditions to listen to a 20-sentence story. Picture subjects viewed illustrations of the story, Imagery subjects were instructed to generate mental pictures of the story, Repetition Control subjects heard each sentence of the story twice, and Control subjects simply listened to the story once. Planned comparisons revealed that Picture subjects outperformed all other groups. Differences among the other conditions, age by conditions interactions, and age differences per se were not significant. A number of theoretically and practically interesting issues are discussed in the context of recent story-recall findings with normal children.

Ghatala, E. S., Levin, J. R., Bell, J. A., & Truman, D. L. The effect of semantic factors on subjects' integration of verbal units in recognition memory. Working Paper No. 211. 5.1.50.35.02.01.02. 25 pp. August 1977.

Two experiments were conducted concurrently to determine whether semantic factors contribute to a previously obtained "nonsemantic" recognition memory effect. It had been found that compound words whose constituents had been originally presented separately were falsely "integrated;" that is, they were believed to have originally appeared as the compound itself. In the research reported here, both correlational- and experimental-level evidence suggest that the degree of semantic overlap between the constituents and their compound is responsible for the magnitude of the effect. In particular, constituents rated closer in meaning to their compounds resulted in more false integrations; and adjectival modifers, as applied to the constituents to orient subjects either "toward" or

"away" from the compound's meaning, appeared respectively to augment or diminish the effect under certain conditions. It was concluded that the integration effect may be attributed to a frequency mechanism which operates independently on semantic and nonsemantic aspects of the materials.

Ghatala, E. S., Levin, J. R., Truman, D. L. Varieties of frequency interference in children's recognition of sentence information. Working Paper No. 200. 5.1.50.35.02.01.01. 26 pp. February 1977.

The memory of fourth grade children for information contained in target sentences presented 24 hours earlier was tested by multiple-choice recognition items, each consisting of a question about a target sentence followed by three response options. The options consisted of the correct word from the sentence, a new word, and an old, incorrect word that was contained in another sentence on the study trial. The results indicated that the amount of interference produced by old information depended upon the relationship between the sentence in which the old information occurred and the target sentence--being the least when the two were unrelated; the most when the two shared the same subject noun (which also occurred in the stem of the test item for the target sentence); and intermediate when the subjects of the two sentences were synonyms. The interference produced by these manipulations was modified by instructional strategies and the distance between the target sentence and its variation. The experiment establishes the validity of contextual frequency accrual, a construct logically necessary in extending frequency theory to recognition of information contained in sentences.

Hubert, L. J., & Levin, J. R. Evaluating priority effects in free recall. Theoretical Paper No. 66. 5.1.10.31.01.14.02. 22 pp. September 1976. ED 144 969.

A randomization model appropriate for evaluating priority effects in free recall (i.e., whether "new" items are recalled prior to "old" items) is discussed and related to well-known nonparametric significance tests. Since the bases for the measures that have been suggested in the psychological literature may be interpreted either in terms of Wilcoxon's rank sum statistic or through a specific entry in a 2 x 2 contingency table, alternative indices of priority can be adopted directly from classical nonparametric statistics. Finally, the mean and variance formulas for a general correlational statistic are provided that specialize to the moments for the two measures already in common use.

Levin, J. R., Ghatala, E. S., & Bender, B. G. What to consider when considering constructing a multiple-choice test. Working Paper No. 195. 5.1.10.31.01.01.03. 22 pp. January 1977.

Theoretical analyses of the multiple-choice test format suggest that a test constructor should give serious consideration to the form in which correct and incorrect alternatives are presented. In this experiment, third and fourth graders were tested for previously exposed information by multiple-choice items in which: (1) correct alternatives were stated in either verbatim or synonym form; and (2) incorrect alternatives consisted of plausible responses that were either familiar or new. Comparisons of errors and error patterns were made between high and low achieving students who had been given one of two different information-processing strategies. Based on a dual test function argument, it was concluded that synonym correct alternatives combined with plausible new responses are the most desirable of the four multiple-choice variations studied here. In particular, such items were sensitive to achievement level and strategy differences without systematically increasing students' likelihood of retaining misinformation.

Levin, J. R., Ghatala, E. S., & Truman, D. L. Phenomenal frequency effects in verbal-discrimination learning: Resolving a discrepancy. Working Paper No. 219. 5.1.50.35.02.01.03. 8 pp. November 1977.

This study was conducted to assess one possible explanation for the failure of a recent experiment to uncover an effect of subjective (phenomenal) frequency in verbal-discrimination learning. It was hypothesized that the effect is more likely to emerge with words representing relatively low values of objective frequency, where variations in phenomenal frequency are presumable greater. Consistent with the hypothesis, college students discriminated objectively low pairs of abstract words better when the phenomenal frequency was low than when it was high; whereas for objectively high frequency pairs, no phenomenal frequency effect was obtained.

Levin, J. R., & Lesgold, A. M. On pictures in prose. Theoretical Paper No. 69. 5.1.50.35.01.01.03. 17 pp. December 1977.

For some time now, researchers and educators have questioned the value of pictures as prose-learning adjuncts. However, given a set of five boundary-defining "groundrules," there is abundant empirical evidence to document the positive value of pictures. In the studies reviewed here, consistent learning gains associated with pictures are obtained. Moreover, the effects are large in a practical sense, and they are found to generalize across a number of situational contexts and learner characteristics.

Levin, J. R., & Pressley, M. A test of the developmental imagery hypothesis in children's associative learning. Working Paper No. 212. 5.1.10.31.01.01.03. 13 pp. September 1977.

Separate samples of kindergarten children were administered a paired-associate learning task at the beginning and end of the school year, under either regular Control or self-generated visual Imagery instructions. Consistent with previous speculations about the relationship between age and the efficacy of imagery instructions on this task, age predicted paired-associate learning performance in the Imagery condition even when amount and quality of school experience were controlled. In contrast, age was not significantly related to learning in the Control condition. These conditions-differentiating correlational patterns, along with predicted variance differences, strongly support the developmental imagery hypothesis.

Peng, C.-Y., & Levin, J. R. Strategies in reading comprehension: IX. Durability of picture effects in children's story recall. Working Paper No. 216. 5.1.50.35.01.01.01. 9 pp. October 1977.

Sixty four second graders were randomly assigned to two experimental groups and two control groups to listen to two 10-sentence stories. Experimental subjects simultaneously viewed story-relevant pictures, while controls viewed the printed text. Recall of the passages was tested by both verbatim and paraphrase questions, immediately after story presentation and/or three days later. Picture groups were markedly superior on both occasions and for both question types. The results extend previous findings documenting the short-term benefits of pictures on this task and, in so doing, raise issues of potential educational importance.

Pressley, M., & Levin, J. R. Developmental constraints associated with children's use of the keyword method of foreign language vocabulary learning. Working Paper No. 209. 5.1.50.35.01.01.05. July 1977.

Second and sixth grade subjects were instructed to learn simple Spanish vocabulary nouns using the keyword method. To remember a foreign word translation, the keyword method user must: (1) associate the foreign word to an English word (the keyword) that sounds like part of the foreign word; and (2) remember an image of the keyword and translation referents interacting. Second grade keyword users who were provided with interactive pictures remembered more vocabulary items than those who generated their own imagery links when given separate pictures of the keyword and translation referents. Second graders who generated their own linking images when given only the keywords and translation words recalled fewer items than both picture

groups, and were not significantly different from control subjects. Sixth graders in the three imagery-link variations performed at comparable levels and better than control subjects. The results are in complete accord with previous speculations about the development of mnemonic strategies in children.

Ruch, M. D., & Levin, J. R. Strategies in reading comprehension: VII. Processing differences associated with pictorial organization and verbal repetition. Working Paper No. 202. 5.1.50.35.01.01.04. 24 pp. March 1977.

Third grade children listened to two 10-sentence narrative passages. Some of the children were presented each sentence only once; others were presented each sentence twice in succession. These conditions were compared with each other, as well as with those in which "partial" pictures (pictures depicting everything except the to-be-probed-for information) accompanied either the passages' sentences or the subsequent short-answer test questions. It was found that partial pictures facilitated performance when presented with the passages, though not when presented with the test questions. These beneficial effects were apparent on two types of short-answer questions presumed to reflect different "depths" of information processing. In contrast, sentence repetition facilitated performance only on questions presumed to reflect relatively shallow information processing.

Snartemo, K. L. The effects of drawing training on young children's paired-associate learning as a function of socioeconomic level and mode of presentation. Technical Report No. 405. (Ph.D. dissertation) 5.1.10.31.01.01.11. 74 pp. November 1976.

This study evaluated the effectiveness of drawing training on the paired-associate learning of lower- and middle-class kindergarten-age children where learning materials consisted of simultaneously presented pictures, successively presented pictures, or successively presented aural nouns. When learning was assessed by recall method, it was found that there were no significant differences between training and control conditions for any of the three presentation modes. Performance of middle-class children surpassed that of lower-class children in the simultaneous picture and successive noun conditions. Comparisons between presentation modes showed simultaneous pictures significantly better than successive pictures, and simultaneous pictures significantly better than successive nouns, and that there was no signficant difference between pictures and nouns when both were presented successively.

ISSUES RELATED TO THE USE OF OBJECTIVE-BASED READING CURRICULA

Faculty Associate:

Wayne Otto, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Demos, E. S. The relationship between mastery of selected word attack skills and reading performance. Technical Report No. 421. (Ph.D. dissertation) 5.1.50.40.01.02.02. 97 pp. October 1977.

The major purposes of this study were to determine the relationship between mastery of a number of selected Wisconsin Design for Reading Skill Development (Design) word attack skills, general reading achievement, and functional word attack ability; and to investigate which of the selected skills were essential to, supportive of, or non-essential to general reading achievement. The study had two secondary purposes: to examine the implementation and testing strategies of two schools using the Design; and to compare the number of attempts to attain mastery of the selected skills and the subjects' performance in decoding synthetic words.

Kamm, K. The study skills element of the Wisconsin Design for Reading Skill Development: A case study. Technical Report No. 422. (Formerly Working Paper No. 203) 5.1.20.40.02.01. 55 pp. March 1977. Reprinted October 1977.

This study was conducted to describe what occurred in two elementary schools implementing for the first time the Wisconsin Design for Reading Skill Development: Study Skills. The intent of the report was to provide guidelines which can be generalized to various school settings to facilitate initial implementation of the Study Skills element.

The students' study skill attainment was assessed at the beginning and end of the year with both criterion-referenced and norm-referenced tests. Descriptions of the teachers' daily instructional, assessment, and management strategies were based on personal interviews and classroom observations.

Over the period of one year, the students' general abilities to interpret maps, graphs, tables, and reference sources stayed the same, but the average gain in number of Design study skills and grade equivalent study skills scores increased for each grade in both schools.

Kamm, K., White, S., & Morrison, B. A study of procedures used in implementing an objective-based reading program in 16 schools. Working Paper No. 226. 5.1.50.40.01.01.03. 67 pp. December 1977.

This report is a summary of the procedures observed in 16 elementary schools using an objective-based, skill-centered approach to reading instruction. This survey is the second step of a five-step study to investigate the concerns teachers have in implementing an objective-based approach to reading instruction.

The study was carried out by three Reading project staff members who interviewed school personnel and observed ongoing reading instruction in each of the 16 schools. In all of the schools the Wisconsin Design for Reading Skill Development is being used as the vehicle for implementing a skills management system. The project staff consider the Wisconsin Design to be a model management system and feel the procedures associated with its use are representative of procedures used with other management systems. The findings, therefore, can be generalized to situations where the Wisconsin Design may not be used, but skills provide the basis for reading instruction.

Klopp, P. M. Preliminary technical manual for forms P and Q of the Wisconsin Tests of Reading Skill Development: Comprehension. Working Paper No. 213. 5.2.45.30.06.03. 62 pp. December 1977.

Test forms P and Q of the Wisconsin Tests of Reading Skill Development: Comprehension assess the 40 skills and objectives of the Wisconsin Design for Reading Skill Development: Comprehension, commercial edition. The tests are a second major edition and represent a substantial redevelopment effort. This report describes the procedures that were used in developing the criterion-referenced tests. The report contains individual test descriptions as well as general descriptive information regarding readability specifications, item content and test format, test directions, scoring and use of test results, and the tryout population. Also provided are the estimated summary statistics for both test forms. This report will be followed by a final technical manual.

White, S. Validation of the effectiveness of the learning center approach to skill instruction. Technical Report No. 384. 5.1.20.40.02.01.03. 69 pp. August 1976.

The Wisconsin Design for Reading Skill Development (the Design) is based on the assumption that individualized reading can become a reality if instruction is focused and differentiated. The Design provides the skills and objectives that focus instruction. Alternative methods for facilitating mastery of these skills

must be provided if instruction is to become differentiated. The purpose of this study was to determine the effectiveness of the learning center approach as a possible alternative method for skill instruction of one skill from the Study Skills element of the Design. The hypothesis was: There will be no significant difference between the posttest scores of students in a teacher-directed group and the posttest scores of students in a learning center group.

Students from two fourth grade classes were given a pretest which consisted of Level D and Level E subtests for Skill 1 from the Representation Strand of the Study Skills element of the Design. Those students who did not master the skill on the pretest were assigned randomly to one of two groups. One group received skill instruction through a teacher-directed approach while the other group received skill instruction in a learning center situation. The instructional period was the same for both groups. After instruction, the students were tested again with the same subtests used in the pretest.

The investigator concluded that the learning center could be offered as an alternative approach to instruction of Skill 1 of the Representation Strand of the Study Skills element of the Design.

White, S., & Demos, E. An objective-based approach to reading instruction: Implementation and evaluation. Working Paper No. 198. 5.1.50.40.01.01.01. 25 pp. July 1977.

The purpose of this study is to investigate characteristics of implementation and to isolate problems in implementing an objective-based approach to reading instruction. Because many objective-based programs share similar components, the Wisconsin Design for Reading Skill Development (the Design) was selected as the vehicle for studying this approach.

A questionnaire was sent to over 100 schools implementing the Design. Based on the response received from 61 school districts across the country, several characteristics of schools implementing this management system were identified.

The questionnaire is the first step in a more extensive study in which schools implementing the Design will be observed and teachers will be interviewed. The findings from this intensive study will be shared with those involved in the implementation of any objective-based approach. Hopefully, one consequence of this study will be to encourage teachers and administrators to initiate their own evaluations of the reading programs in their schools.

STUDIES IN MATHEMATICS

DMP IN USE

Faculty Associate:
Thomas A. Romberg, Department of Curriculum and Instruction

Senior Scientist:
James M. Moser, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Moser, J. M., Trice, G. N., Moser, M. K., & Schall, W. E. Developing Mathematical Processes (DMP): User data report level K. Working Paper No. 220. 5.1.40.50.11.01. 140 pp. December 1977.

This report describes the user data for Developing Mathematical Processes (DMP), Level K. These data were collected during the spring of 1976, and during the 1976-77 school year. Data were collected by means of individual interviews conducted at regular six or seven week intervals during the time period described above. Teachers from schools located in the states of California, Wisconsin, and New York participated in the study. The data are divided into three categories. First, they are responses to specific questions posed on a written questionnaire that had four parts--individual teacher characteristics, DMP materials, assessment and record keeping, and management and use of the program. Second, teacher comments and reactions to various topics and activities in DMP Level K were collected in an unstructured manner. Third, when available, records of children's levels of mastery on the regular objectives of the topics in DMP Level K were collected and are reported in this document.

Moser, J. M., Trice, G. N., Moser, M. K., & Schall, W. E. Developing Mathematical Processes (DMP): User data report level 1. Working Paper No. 221. 5.1.40.50.11.01. 200 pp. December 1977.

This report describes the user data for Developing Mathematical Processes (DMP), Level 1. These data were collected during the spring of 1976, and during the 1976-77 school year. Data were collected by means of individual interviews conducted at regular six or seven week intervals during the time period described above. Teachers from schools located in the states of California, Wisconsin, and New York participated in the study. The data are divided into three categories. First, they are responses to specific questions posed on a written questionnaire that had

four parts--individual characteristics, DMP materials, assessment and record keeping, and management and use of the program. Second, teacher comments and reactions to various topics and activities in DMP Level 1 were collected in an unstructured manner. Third, when available, records of children's levels of mastery on the regular objectives of the topics in Level 1 were collected and are reported in this document.

Moser, J. M., Trice, G. N., Moser, M. K., & Schall, W. E. Developing Mathematical Processes (DMP): User data report level 2. Working Paper No. 222. 5.1.40.50.11.01. 194 pp. December 1977.

This report describes the user data for Developing Mathematical Processes (DMP), Level 2. These data were collected during the spring of 1976, the 1976-77 school year, and the fall of 1977. Data were collected by means of individual interviews conducted at regular six or seven week intervals during the time period described above. Teachers from schools located in the states of California, Wisconsin, and New York participated in the study. The data are divided into three categories. First, there are responses to specific questions posed on a written questionnaire that had four parts--individual teacher characteristics, DMP materials, assessment and record keeping, and management and use of the program. Second, teacher comments and reactions to various topics and activities in DMP Level 2 were collected in an unstructured manner. Third, when available, records of children's levels of mastery on the regular objectives of the topics in DMP Level 2 were collected and are reported in this document.

Wearne, D. C., & Romberg, T. A. DMP accountability tests. Working Paper No. 217. 5.2.23.20.04.04.02. 320 pp. in 2 parts. December 1977.

Developing Mathematical Processes (DMP) is a new elementary mathematics program developed from a measurement approach. In DMP children examine objects, focus on an attribute, then use various processes to explore relationships between objects on that attribute. Once they are familiar with each attribute, they symbolically represent it, and represent mathematical sentences with real objects to check their validity.

Because DMP stresses different objectives and has a different sequence, it was felt that the traditional model of assessment (a standardized test) was in general inappropriate to assess year-end achievement for students in DMP. Beginning in 1974, plans were made to create a new set of Accountability Tests for implementation of DMP which could be used as a replacement for the standardized tests. The purpose of this working paper is to summarize the outcome of that work. Nine tests were developed. Three types of tests--a Computation Test, a Concepts-Processes Test, and an Application-Problem Solving Test--were prepared for each of the three levels of materials--K-2, 3-4, and 5-6. This paper outlines the development of those tests.

DMP FIELD-BASED CLASSROOM EXPERIMENTATION

Faculty Associates:

John G. Harvey, Department of Curriculum and Instruction
Thomas A. Romberg, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Burke, M., Hiber, N., & Romberg, T. The teaching of initial fractions concepts. Working Paper No. 218. 5.1.40.51.01.02.09. 362 pp. in 2 Parts. December 1977.

This working paper is a product of a graduate research seminar in mathematics education offered in the Department of Curriculum and Instruction during the spring semester 1976-77 at the University of Wisconsin. The seminar focused on the teaching of initial fraction concepts to young children.

The paper represents a careful re-examination of initial instruction of fractions. This synthesis of the teaching of common fractions provides a starting point for a sequence of research studies.

DEVELOPMENT OF BASIC MATHEMATICAL SKILLS

Faculty Associates:

Thomas P. Carpenter, Department of Curriculum and Instruction
Thomas A. Romberg, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Romberg, T. A. The effect of overt verbalization on the learning and retention of geometry concepts. Working Paper No. 189. 5.1.20.50.05.01.06. 125 pp. December 1977.

This paper reports the results of evidence gathered about the effect of subjects' overt verbalization on performance and retention after instruction on a set of geometric concepts. The independent variable, overt verbalization, was manipulated in this study following the procedure used by Pereira which involved an experimenter questioning subjects during or after instruction. Instruction was carried out using semi-programmed materials developed by Frayer. A post test-retention test, 2 X 2 factorial experimental design with random assignment of subjects to treatments was followed. The results on both a terminal test and a retention test failed to indicate a significant main effect for either verbalization during or after instruction. A different study with a more adequate instructional program is warranted to test the hypotheses under investigation.

Wearne, D. C. Development of a test of mathematical problem solving which yields a comprehension, application, and problem solving score. Technical Report No. 407. (Ph.D. dissertation) 5.1.20.50.07.01. 158 pp. ED 144 958.

The purpose of this study was to develop a test of mathematical problem solving behavior which provided information about the child's mastery of the prerequisites of the problem solving questions. To provide this additional information, each problem solving question was preceded by two other questions. The comprehension question assessed the child's understanding of the information contained in the item stem of the problem solving question. The application question assessed the child's knowledge of an underlying concept of the problem solving question. The study

was concerned with (1) determining if asking multiple questions on the same unit of information affects the response to those questions, and (2) measuring the extent to which the questions preceding the problem solving question were assessing pre-requisites of the problem solving question.

STUDIES OF THE IMPLEMENTATION OF INDIVIDUALIZED SCHOOLING

STUDIES OF THE IMPLEMENTATION OF INDIVIDUALIZED SCHOOLING

Faculty Associate:

Marvin J. Fruth, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Gardner, B. The implementation of IGE in large urban systems: Four case studies. Technical Report No. 406. 5.1.80.21.11.01.01. 35 pp. March 1977.

These four case studies attempt to document the Center's involvement in the implementation of IGE schools in four large urban systems: Chicago, Los Angeles, New York City, and the District of Columbia. In these studies, attention is focused on the results of the Center's efforts to ascertain the strategies and conditions required for implementing IGE in large urban systems and inner-city schools. Each case study is divided into five sections: initial contacts with the Center, internal conditions in the schools, internal conditions in the districts, conditions in other educational agencies, and concluding comments.

Given the limited opportunity and success of the Center in working with large urban school systems over the past four years, considerable knowledge was gained for refining the strategy for urban implementation of IGE. Based upon our experiences, the major factors that appear to influence the growth and development of IGE in large urban areas are (1) availability of fiscal and personnel resources and financial stability of the school system, (2) the system's commitment and support, (3) stability and tenure of staff, (4) support of teacher organizations as well as parent/community groups, and (5) the cooperation of teacher education institutions.

In the final analysis, it appears that any combination of these factors, plus some unanticipated consequences, tends to play a major role in whether or not IGE is established and continues to grow within these urban school systems. When these factors work in favor of innovation or change, IGE tends to flourish.

NETWORK CAPACITY BUILDING AND MAINTENANCE FOR RESEARCH AND DEMONSTRATION

Faculty Associate:

Marvin J. Fruth, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Krupa, W. E. Implementation networks: An examination of the structural and operational dimensions. Working Paper No. 184. 5.1.80.21.31.01.01. 114 pp. July 1977.

Since 1971, the University of Wisconsin Research and Development Center for Cognitive Learning has engaged in a national effort to disseminate Individually Guided Education (IGE). One of the results of this effort is the evolution of unique intra- and interstate relationships that have emerged to forge an implementation network.

The purpose of this paper is to examine selected salient factors involved in the development, maintenance, and refinement of implementation networks. It provides a brief history and description of IGE implementation networks and presents several dimensions viewed as critical to the successful development and operation of implementation networks.

The paper also presents examples of several network structures and samples of network communications which provide insight into the nature and frequency of network interaction.

EVALUATION OF PRACTICES IN INDIVIDUALIZED SCHOOLING

LARGE SAMPLE BASIC STUDY

Faculty Associates:

Gary G. Price, Department of Curriculum and Instruction
Thomas A. Romberg, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS
PRACTICAL PAPERS, AND WORKING PAPERS

Price, G. G. Sampling for phase I of the IGE evaluation. Working Paper No. 223. 5.2.81.60.11.02.01. 71 pp. December 1977.

This document describes the procedures used to select the sample of schools being studied in Phase I of the evaluation of Individually Guided Education (IGE). Phase I of the evaluation is a large sample study that uses structural equations methods to examine relations between certain features of IGE schools and both pupil and staff outcome variables. The document also describes both the population of IGE schools and the sample, thereby providing an objective basis for judging the representativeness of the sample.

A sampling procedure based on stratified random sampling was chosen to assure that the sample would reflect the full range of variability of IGE schools with respect to characteristics measured by the IGE Schools Questionnaire of March 1976. Such a full range of variability is especially important when, as in Phase I, relations between school characteristics are being studied.

Too few of the initially selected schools agreed to participate, so it became necessary to request the participation of those schools that were not initially selected. The sampling frame that was developed for stratified random sampling can be used to gauge how well the participant schools represent the total population, despite the evident dangers of self-selection in the sample.

REFORM/RENEWAL IMPACT OF IGE

Faculty Associates:

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Thomas A. Romberg, Department of Curriculum and Instruction
B. Robert Tabachnick, Department of Curriculum and Instruction
Gary G. Wehlage, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Popkewitz, T. S. Educational reform and the problem of institutional life. Theoretical Paper No. 70. 5.2.81.60.13.01.01. 31 pp. December 1977.

Discussion of educational reform/renewal involves consideration of the institutional characteristics of schooling. Schools have underlying patterns of conduct, belief, and values which provide meaning to the ongoing activities of learning. These patterns and assumptions of school life have tended to produce standardized educational experiences, emphasize certain knowledge which is technical rather than imaginative, and maintain noncritical and protective professional activities. Specific efforts toward institutional reform, such as Individually Guided Education, should consider their programmatic strategies (organizational designs, instructional models, or evaluation procedures) in relation to their impact upon the institutional quality of school life.

Popkewitz, T. S., & Wehlage, G. Schooling as work: An approach to research and evaluation. Working Paper No. 196. 5.2.81.60.13.01.02. 28 pp. April 1977.

Educational research and evaluation involves consideration of at least two dimensions. First, what is learned in school should be considered as involving more than learning a subject-matter. Participants in school learn norms, beliefs, and patterns of behavior as well as a content. Second, discovering what is learned involves understanding how people act and respond within the social contexts of educational programs. The interrelationship between language and action are the focus of inquiry.

The concept of work is proposed to penetrate the relationship between school activities and the assumptions, values, purposes,

and sense of competencies teachers and students hold. Work is viewed as having three attributes: the activities people are asked to do; the interactions contained in these activities; and the sentiments or beliefs produced by the activities or interactions. Illuminating the interrelationship of these attributes can enable researchers to understand the anticipated and unanticipated consequences of educational programs.

COMPLETED PROJECTS

PREREADING/EARLY READING SKILLS

Faculty Associate:

Richard L. Venezky, Department of Computer Sciences

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Massaro, D. W., Venezky, R. L., & Taylor, G. A. Orthographic regularity, positional frequency, and visual processing of letter strings. Technical Report No. 413. 5.1.20.45.01.07.09. 64 pp. April 1977. ED 138 968.

The current research studied the role of orthographic regularity and summed positional frequency in the perception of letter strings. College sophomores and sixth grade readers were asked to indicate whether or not a target letter was present in a six-letter string. Orthographic regularity and summed positional frequency were found to have no effect on reaction time. In contrast, the number of letters in the catch string that were physically similar to the target letter had a large effect on reaction time. These results held for both groups of readers. In another experiment, the letter string was presented for a short duration, followed immediately by a masking stimulus, and then by the target letter. College readers indicated whether or not the target was present in the test string. Accuracy of performance was critically dependent on the orthographic regularity and summed positional frequencies of the letters in the test string. No effect of letter similarity was observed. The large differences that were observed between these two tasks can be accounted for in terms of the stages of processing that are critical for performance in the tasks.

Pittelman, S. D., & Felker, M. P. Introducing PRS to Spanish-speaking children. Working Paper No. 204. 5.2.41.60.08.01.01. 83 pp. April 1977.

PRS, the Pre-reading Skills Program, was developed at the Wisconsin Research and Development Center for Cognitive Learning, and was published by Encyclopaedia Britannica Educational Corporation in September 1974. PRS prepares children for learning to read by providing instruction in specific prereading skills, and

continual exposure to the vocabulary and formats of initial reading programs, and by engendering a positive attitude toward learning to read. The program was developed after four years of research in prereading skills and was field tested in a wide variety of locations, including schools near Indian reservations and in the inner core of Chicago and Milwaukee.

During the developmental stages of PRS, the special needs of bilingual students were not specifically investigated since the primary goal of the project was to develop a prereading program for children who would learn to read in English. However, upon publication of the program, it became increasingly evident that the program would be taught in classrooms where students were not only preparing to read in English but also were learning to speak English as a second language. To help students in these classrooms, especially Spanish-speaking children, a study was conducted to determine how PRS could be used in bilingual classrooms. The study led to the development of the PRS Vocabulary Segment, which is a supplement to PRS that is designed primarily to teach children the English Vocabulary words needed to participate in the PRS sound activities. This paper reports the study conducted and also describes the development and field testing of the PRS Vocabulary Segment.

Pittelman, S. D., & Kamm, M. R. PRS Pre-reading skills program inservice guide. Practical Paper No. 17. 5.2.41.40.01.01.01. 110 pp. May 1977.

While field tests of PRS have indicated that the program can be successfully implemented without extensive inservice training, school systems and universities have expressed interest in providing instruction for teachers which incorporates information about PRS into an introductory course on prereading skills and reading readiness. This guide has been published to provide them assistance.

The course outlined in this manual is an enriched preservice for teachers who will be implementing PRS to prepare children in their classes for reading instruction. While PRS is introduced in detail, the course also includes a general introduction to reading readiness and to individualized instruction.

Venezky, R. L., Chicone, S., & Perry, J. On-line diagnosis of reading difficulties-II. Technical Report No. 386. 5.1.20.45.01.07.03. 38 pp. September 1976. ED 141 791.

Diagnostic tests for nine different letter-sound patterns were developed for the PLATO CAI system and administered to 122 first, second, and third graders. The purpose of the tests was to

assess the feasibility of on-line diagnosis of basic reading skills. Results for four of the patterns--initial g, final g, final c, and bisyllabic a--showed low test reliabilities and no monotonic increase for percentage correct with increasing grade level. The remaining tests had relatively high reliabilities and monotonically increasing scores with increasing grade level. The most reliable subtests for separating grade level were the soft pronunciation of c and the long and short pronunciations of i, o, and u.

Correlations between tests (uncorrected for attenuation) were relatively low, except for the vowels in monosyllabic words, which varied from .57 (i-o) to .30(i-u). Rank order correlations between grades based on ranking within grade of tests by percentage correct varied from .87 (grades 2 and 3) to .65 (grades 1 and 3). A relatively high percentage of the subjects (approximately 25 percent) showed evidence of random responding.

From these results, an improved diagnostic system has been planned, using coarse to fine grain progression and response contingent item and test selection.

Venezky, R. L., Perry, J., Chicone, S., & Pittelman, S. Summary of studies for an on-line reading diagnosis system-III. Technical Report No. 409. 5.1.20.45.01.07.08. 70 pp. March 1977. ED 138 967.

Three studies were performed to test the feasibility of the PLATO Computer Assisted Instruction system for on-line testing of reading skills. In Study 1 three different approaches to vocabulary assessment were tested: self-screening, synonym, and word matching under brief exposure. One hundred ten subjects from a Chicago, Illinois, public elementary school received from one to three levels of each test format via PLATO terminals. Branching to levels within each format was under program control. The results revealed problems both with test formats and with test items.

Based on these results, improvements were made to the testing programs and a second group of 95 subjects was run. The results from these tests showed an expected range of scores for the Synonym and Self-screening Tests, but cast further doubt on the validity of the Timed Exposure Test. A third study, directed toward the validity of this test, led to the rejection of the timed exposure paradigm.

SPECIALIZED OFFICE THREE

Project Director:

Jean K. Elder

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Elder, J. K., & Jipson-Greenstein, J. A. Final technical report of Specialized Office Three. Technical Report No. 440. 6.4.10.91.01.01.40. 445 pp. in 2 Parts. November 1977.

The Final Technical Report of Specialized Office Three (S-3) describes the activities of S-3 in improving the quality of instruction provided to individuals with exceptional educational needs, other than the deaf and blind, through media, materials, and educational technology. S-3 was primarily involved in locating and evaluating existing instructional materials for its target population; adapting instructional materials to make them more appropriate for the target population; and evaluating materials with the target population.

S-3 entered 14,321 instructional media and materials into the National Instructional Materials Information System (NIMIS). A standardized system for locating, accessing, and abstracting materials was initiated and the Materials Accession Process (MAP) for using teacher input to locate materials and media was developed. S-3 also developed a systematic procedure (Adapting Instructional Materials [AIM]) for identifying and adapting/developing products to better meet the needs of the target population. Two materials were carried through the AIM process and were formally evaluated.

S-3 recommends a focus in future project efforts on the refinement of the MAP and its application to all handicap areas. S-3 further recommends a review and reorganization of Thesaurus descriptors and handicapping condition codes and for the further standardization and simplification of the "locate abstract" process. Continued use of the product adaptation and development procedure is also strongly urged.

MODELS FOR IGE-SECONDARY

Faculty Associate:

Gerald Nadler, Department of Industrial Engineering

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Schultz, J. V., Ellenz, J. R., & Struve, P. W. Winnequah School case study: An individualization alternative for secondary reform. Technical Report No. 403. 5.2.80.24.01.11.03. 31 pp. November 1976. ED 135 052.

This document describes the involvement of the Individually Guided Education/Secondary Project (IGE/S) with a Wisconsin middle school from March 1975 to June 1976. The guiding purpose was to conceptualize and implement a change process that would aid schools to become IGE places of learning.

A sequence of change operations was followed and the activities that were carried out are presented. The five phases in this sequence were an awareness phase, a commitment phase, a change-over phase, a refinement and implementation phase, and a renewal phase.

The focus for all activities in each of the phases was a target program of individualization that was cooperatively developed and subsequently implemented. This target program, its implementation, and the results obtained are presented.

NUMERICAL LISTING

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